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HAWAIIAN PANICUM, METROSIDEROS,
SANICULA, LOBELIA, AND ROLLANDIA

By

HAROLD ST. JOHN AND EDWARD Y. HOSAKA

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INTRODUCTION

In 1931 floristic and ecological studies of Kipapa Gulch, Oahu, were undertaken by E. Y. Hosaka under the direction of Professor Harold St. John. During the period of investigation (1931-34) about ninety field trips were made into the native forests of Kipapa Gulch and the plants of the region collected. Several new species of plants were found and some of them are described here. *Sanicula Kaudiensis* and *Metrosideros macropus* forma *ruber* are from other localities.

FAMILY GRAMINEAE

Panicum koolauense St. John and Hosaka, new species (fig. 1; pl. 1).

Perenne caespitosum, culmis 5-15 cm longis, vaginis pilosulis ciliatisque, ligulis 0.1-0.2 mm longis pilosulis, laminis 7-18 mm longis 1-1.8 mm latis, inflorescentiis glabris, spiculis 2-2.3 mm longis glabris, gluma exteriori ovali viridi vel purpurascenti trinervi marginibus hyalinis, gluma interiora elliptica 9-nervosa ad lemmatibus subaequali marginibus hyalinis, lemmatibus sterilibus ovato-ellipticis viridibus ad apicem subcucullatis subacutis 7-nerviis.

Plant perennial, forming large loose tussocks or mats; branches 5-15 cm long, ascending; innovations extravaginal; sheaths pilosulous at base, strongly veined, shorter than the glabrous internodes, the margins pilose ciliate; ligule 0.1-0.2 mm long, pilosulous; blades 7-18 mm long, 1-1.8 mm broad, linear-lanceolate, firm, the nerves prominent above, scaberulous, less so beneath, flat or in mature plants more or less inrolled; inflorescence rarely a panicle, commonly reduced to a raceme of 2-3 (-6) spikelets, often shorter than or equaling, occasionally somewhat protruding beyond the subtending leaves; axis of raceme glabrous; pedicels 0.3-0.9 mm long, ascending, glabrous; spikelets 2-2.3 mm long, glabrous, terete or slightly compressed dorsally; first glume 1/2 to 3/5 as long as the spikelet, oval, concave, green or purplish, the midrib heavy, riblike, the 2 lateral nerves distant, not reaching the apex, the sides and margins subhyaline; second glume almost equaling the sterile lemma, usually green, elliptic, with 9 prominent nerves, the nerves scaberulous laterally, the margins hyaline; sterile lemma slightly cucullate subacute at apex, ovate-elliptic, green, 7-nerved, the nerves scaberulous laterally; palea half as long, ovate, membranous; fertile lemma 1.5-1.7 mm long, cartilaginous narrowed and pilosulous at apex; palea nearly as large, enfolded, cartilaginous; anthers 0.7 mm long, oblong, deeply cleft at each end, magenta-purple; stigmas magenta to brown; lodicules broadly cuneate, oblique at tip, whitish; mature grains not seen.

This new species is to be placed in the subgenus *Eupanicum* and the section *Turfosa*, as defined by Pilger¹. This recently described section contains only the three additional Hawaiian species, *P. isachnoides*, *P. imbricatum*, and *P. Hillebrandianum*. The closest relative of *P. koolauense* is apparently *P. imbricatum* Hillebrand.

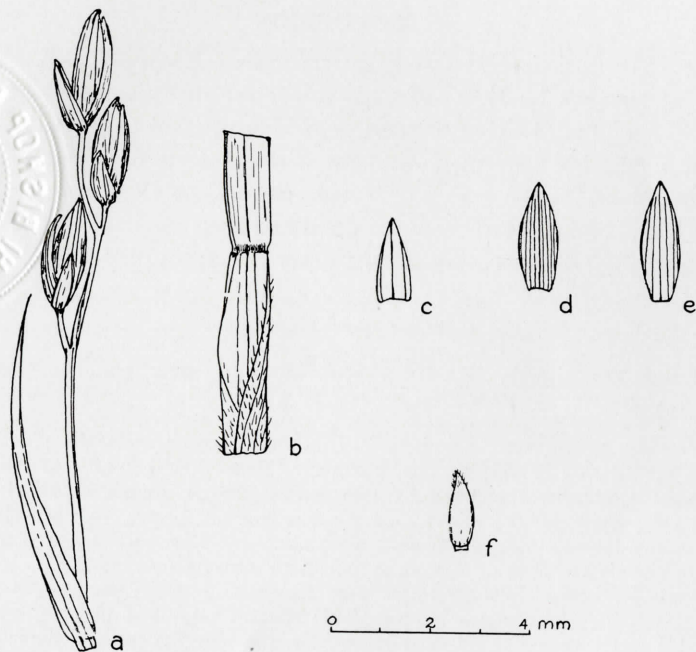


FIGURE 1.—*Panicum koolauense*: a, inflorescence; b, leaf; c, first glume; d, second glume; e, sterile lemma; f, fertile lemma.

Panicum imbricatum differs in having the tussocks dense, becoming firm; the ligule 0.5-1 mm long, pilose; the blades 9-17 mm long, 2.3-4 mm wide; the inflorescence with the lower axils and often the lower axis pilose; the first glume $1/4$ to $1/3$ as long as the spikelet, orbicular ovate, abruptly acuminate, closely enveloping the base of the spikelet; and the sterile lemma with the interval between the nerves 3-4 times the width of the nerves. *P. Koolauense* is distinguished by having the tussocks loose, easily compressible; the ligule 0.1-0.2 mm long, pilosulous; the blades 7-18 mm long, 1-1.8 mm wide; the inflorescence glabrous; the first glume $1/2$ to $3/5$ as long as the spikelet, oval, lying on one side of the spikelet, not closely enveloping it; and the sterile lemma with the interval between the nerves twice the width of the nerves.

¹ Pilger, R., Berlin Bot. Gard. Mus., Notizblatt, vol. 11, p. 243, 1931.

Oahu, Koolau Range, Waipio, Kipapa Gulch: main divide, altitude 2,800 feet, September 18, 1932, E. Y. Hosaka no. 709; on wet ridge, 2,800 feet, August 6, 1933, E. Y. Hosaka no. 1154; on denuded divide, 2,800 feet, July 4, 1932, E. Y. Hosaka no. 630; wet forest, 2,800 feet, top of ridge, February 10, 1935, H. Morley no. 190. Waikane-Schofield Trail, Kahana, Koolau Range: January 19, 1930, H. St. John no. 10178 (type in Bishop Museum).

Panicum imbricatum, described from the mountains of west Maui, occurs also in east Maui, on the mountains of Molokai, and on Kauai. Of the various other localities cited by Hitchcock² some are to be listed under other species or varieties. The Oahu record by Forbes in 1909 is *P. koolauense*. From Kauai, Forbes no. 879 is *P. isachnoides*, variety *Kilohanae*.

Panicum koolauense grows in tussocks on the open windswept crest of the Koolau Range, Oahu, at an altitude of 2,400-2,800 feet. The tussocks are 2 to 3 inches high and up to 3 feet in diameter on the wet ground. They are abundant and often 10 to 25 or more are joined together to form a pure covering. The tussocks are soft like a cushion and yield easily to pressure. Associated with this grass are found *Lobelia Gaudichaudii*, *Plantago pachyphylla*, *Viola oahuensis*, *Nertera depressa*, *Peperomia oahuensis*, *Sadleria cyatheoides*, *Mariscus angustifolium*, *Lycopodium cernuum*, *Lobelia oahuensis*, *Isachne pallens*, and mosses.

FAMILY MYRTACEAE

Metrosideros macropus Hooker and Arnott, forma **ruber** St. John, new form.

A specie differt in petalis staminibusque rubris.

Differing from the species by having the petals and stamens red.

Oahu: 20-foot tree, wooded ridge, altitude 1,900 feet, main ridge running southwest from Puu Lanihuli, Kalihi-Nuuanu, November 29, 1931, Harold St. John, no. 11191 (type in Bishop Museum).

The species, *M. macropus*, grew on the same ridge of Lanihuli and was collected on the same trip, St. John 11182. It had the usual lemon-yellow flowers. No other color forms have been recorded for this species, though in *M. collina* and its subdivisions they are fre-

² Hitchcock, A. S., The grasses of Hawaii: B. P. Bishop Mus., Mem., vol. 8, no. 3, p. 195, 1922.

quent. In the form here described no indications of hybridization have been observed. It has all the morphological traits of *M. macropus* and seems to be truly a color form with anthocyanin pigment in the flowers.

FAMILY UMBELLIFERAE

Sanicula purpurea St. John and Hosaka, new species (fig. 2; pl. 2).

Perennis, 8-30 cm alta glabra, laminis 2.5-8 cm diametro suborbicularibus 5-7-lobatis vel -fidis, lobis paucis dentatis, foliis caulinis frequenter nullis, bracteis inflorescentiae foliosis superioribus palmate-fidis vel -lobatis, partis oblongis non-laciniatis; dimidio-cymis 4-13 cm longis multo umbeliferis, umbelis 7-13-floriferis, flora centrala bisexuala, floribus marginalibus masculis pistillis abortivis, sepalis 1-1.2 mm longis lanceolatis, petalis 1.7-1.9 mm longis purpureis inflexis, staminibus 2-2.3 mm longis inflexis, antheris 0.3 mm longis ovalibus brunneis, stylopodiis oblongo-pyramidosi, floribus bisexualibus sepalis 1.5 mm longis lanceolatis, petalis 1.5-1.8 mm longis ovato-lanceolatis cuneatis inflexis, filamentis 1 mm longis, antheris 0.2 mm longis ovalibus brunneis, stylopodiis 0.5-0.6 mm longis subcylindraceis truncatis, fruticibus 3-3.5 mm longis, mericarpiis subglobosis 2-2.5 mm latitudine, aculeis 1-1.4 mm longis rectis non-hamosis divergentibus.

Perennial; rootstock woody, dark, slender, or in large plants much contorted and thickened, as much as 4 cm in diameter; plants 8-30 cm tall; glabrous, malodorous, the larger plants many-stemmed; basal leaves with petioles 6-23 cm long, the blades 2.5-8 cm in diameter, firm, chartaceous, suborbicular, with 5-7 shallow, rounded lobes or cleft into 5-7 obovate or suborbicular lobes, the lobes with a few coarse, rounded teeth, or the larger lobes slightly lobed, the sinus broad, the veins impressed above, prominent below; cauline leaves below the inflorescence commonly none, when present, single, 20-32 mm in diameter, and 3-5-lobed $1/2$ to $2/3$ towards the base, the lobes obliquely obovate and shallowly lobed into a few obovate or suborbicular ultimate lobes, these remotely apiculate-crenate or serrate; inflorescence leafy, the uppermost ones reduced, palmately cleft or lobed into oblong divisions, not lacinate; inflorescence 4-13 cm long, a 1-sided cyme, with numerous umbels, umbels with 1, rarely 2, sessile, central, perfect flowers, the sterile flowers 6-12; involuclis numerous, 3-6 mm long, oblong or oblance-oblong, obtuse, foliaceous; sterile flowers marginal, on pedicels 2-4 mm long; the calyx 1-1.2 mm long, divided nearly to the base into lanceolate lobes; petals 1.7-1.9 mm long, madder purple, ovate-lanceolate, cuneate, the midnerve heavy, raised, inflexed and bent almost double; stamens 2-2.3 mm long, exserted, the filaments inflexed at tip, the anthers 0.3 mm long, brown, oval, emarginate at apex; stylopodium always present, well-developed, oblong-pyramidal; styles abortive or often styles and stigmas perfectly developed; ovary abortive; perfect flowers with calyx-lobes 1.5 mm long, lanceolate; petals 1.5-1.8 mm long, madder purple, ovate-lanceolate, cuneate, the midnerve heavy, raised, inflexed and bent almost double; stamens exserted, the filaments 1 mm long, the anthers 0.2 mm long, brown, oval; stylopodium 0.5-0.6 mm long, subcylindric, truncate; styles 1.3-1.5 mm long, exserted, reflexed; stigmas minute, pyramidal, papillose, ovary densely bristly throughout, the bristles nearly straight, the lower ones progressively shorter, the upper ones 1.5 mm long, fruit with the body 3-3.5 mm long, bristly through-

out; mericarps subglobose, 2-2.5 mm wide, bristly to the base, the bristles 1-1.4 mm long, very numerous, nearly straight, slender not conspicuously enlarged at base, divergent, the basal ones only slightly shorter, commissural side smooth; seed in cross section oval, but the commissural face deeply channelled.

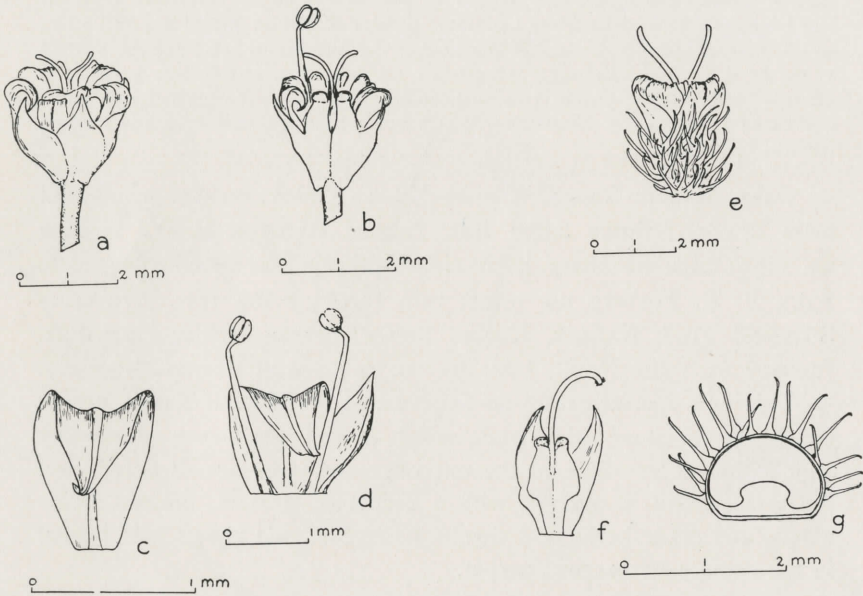


FIGURE 2.—*Sanicula purpurea*, a-d sterile flower, e-g perfect flower: a, flower; b, longitudinal section; c, petal; d, part of flower; e, flower; f, part of flower; g, cross section of fruit.

Sanicula purpurea is to be placed in the section *Campylospermae* as treated in the monograph by Hermann Wolff³. The new species does not seem to be closely related to any other species, but of the species in this section of the genus the Hawaiian species *S. sandwicensis* Gray is apparently the closest. Between these two there are many differences.

S. sandwicensis has the plant 25-60 cm tall; the basal leaves parted to the base or cleft nearly to the base into 3-5 narrow lobes, the ultimate lobes 3-18 mm wide, sharply serrate, with aristate teeth; the uppermost leaves of the inflorescence palmately cleft and sharply laciniate; pedicel of sterile flower 1-2 mm long; sterile flower with petals and anthers yellow; perfect flowers several in each umbel, in fruit densely capitate; calyx-lobes 1-1.2 mm long, ovate, acute; petals 1-1.2 mm long, yellow, ovate, acuminate; fruit with the

³ Engler, A., Pflanzenr. IV, Fam. 228, p. 68, 1913.

body 3-3.5 mm long; mericarps 1.4-1.5 mm wide, ellipsoid, the lower third merely tuberculate, not bristly; commissural side rugose, with 2 large oil-tubes.

S. purpurea has the plant 8-30 cm tall; the basal leaves with 5-7 shallow rounded lobes, or cleft 1/2 to 2/3 of the way down into 5-7 obovate or sub-orbicular lobes, the lobes with a few, coarse, rounded teeth, or the larger slightly lobed; the uppermost leaves of the inflorescence palmately cleft or lobed into oblong divisions, not laciniate; pedicel of sterile flower 2-4 mm long; sterile flower with petals madder-purple and the anthers brown; perfect flowers 1, rarely 2, in each umbelet; calyx-lobes 1.5 mm long, lanceolate; petals 1.5-1.8 mm long, madder-purple, ovate-lanceolate; fruit with the body 3 mm long; mericarps 2.5 mm wide, subglobose, bristly to the base; commissural side smooth, without oil-tubes.

Oahu, Koolau Range, Waipio, Kipapa Gulch: on wet windswept main divide, altitude 2,800 feet, August 6, 1933, E. Y. Hosaka no. 1135; exposed mossy, turfy ridge, altitude 860 meters, August 6, 1933, F. R. Fosberg no. 9734; rain forest, 2,600 feet. Waikane-Schofield Trail, Kahana, Koolau Range: grassy divide, 2,400 feet, January 19, 1930, H. St. John no. 10179 (type in Bishop Museum).

This new species grows on the crest of the Koolau Range, across which the moisture-laden trade winds and clouds sweep incessantly and boisterously. Due to the exposure the trees are dwarfed, and the wet ground is covered with a carpet of grasses, mosses, liverworts, and other herbs and shrubs. The *Sanicula* grows half buried in the spongy herbaceous carpet.

Sanicula kauaiensis St. John, new species (fig. 3).

Perennis 20-23 cm alta glabra, radice lignosa, laminis superioribus 10-25 mm longis sessilibus vel petiolis membranaceis maxime 9 mm longis, laminis 3-7-partitis segmentis lanceo-oblongis 2-4 mm latis spinuloso-lacinato-dentatis, involucelis multis lanceo-linearibus 2-5 mm longis, floribus masculis 3-5 tepalis 1.7-2 mm longis lanceo-ovatis, petalis lanceo-ellipticis cuneatis lutescentis inflexis 1 mm longis, floribus hermaphroditis sessilibus 3-6, sepalis lanceo-ovatis acutis 1.5 mm longis, petalis lanceo-ellipticis cuneatis 1.2 mm longis lutescentibus inflexis, fruticibus 2.5-3.2 mm longis, mericarpis oblanceolatis 1.1-1.3 mm longis, valde aculeatiferis aculeis lutescentibus rectis ascendentibus non hamosis.

Perennial, glabrous, 20-23 cm tall; taproot dark, woody, up to 7 mm in diameter, with several stout secondary roots; basal leaves not seen; nodes below the inflorescence 2-3, tumid; stem erect, dark reddish tinged, longitudinally striate or ridged; the upper 4-5 nodes bearing axillary, floriferous, divergent branches; upper cauline blades 10-25 mm long, sessile or with broad clasping, membranous margined petioles up to 9 mm in length, the blades 3-7-parted nearly to the base into lanceolate-oblong segments about 2-4 mm wide, deeply spinose-lacinately toothed; inflorescence about 15 cm long, a round-topped, symmetrical cyme; with numerous umbels; peduncles 8-24 mm long, ascending; umbels with 3-6 central, sessile perfect flowers, and 3-5 marginal, sterile flowers; involucels 2-5 mm long, numerous, linear-lanceolate, entire, sharp-pointed,

foliaceous; sterile flowers on pedicels 1.5-2 mm long; the calyx 1.7-2 mm long, divided nearly to the base into lanceolate-ovate, acute lobes; petals 1 mm long, apparently yellowish or somewhat purplish tipped, lanceolate-elliptic, cuneate, sharply inflexed a little above the middle, the midnerve heavy; the mericarps oblong, abortive; perfect flowers with the calyx-lobes 1.5 mm long,

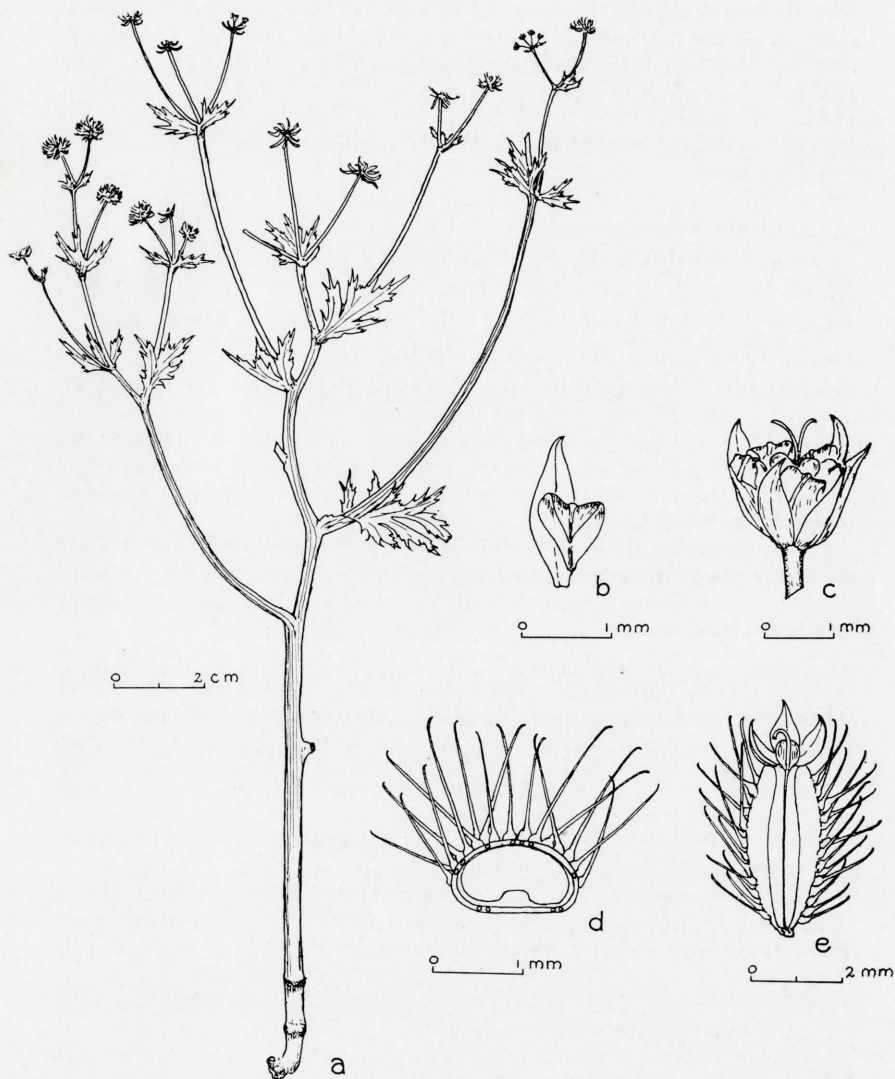


FIGURE 3.—*Sanicula kauaiensis*: a, habit; b-c, sterile flower; d, cross section of fruit; e, half of flower and fruit.

lanceolate-ovate, acute; the petals 1.2 mm long, lanceolate-elliptic, cuneate, apparently yellowish, strongly inflexed a little above the middle, the midnerve heavy; stylopodium oblong-obpyramidal; styles 0.8 mm long, recurved; stigmas minute, pyramidal, papillose; ovary densely covered with yellowish bristles, these 1.5-2 mm long, yellowish, straight, ascending, not hooked, the very basal ones shorter; fruit with the body 2.5-3.2 mm long, bristly throughout; mericarps 1.1-1.3 mm wide, oblanceoloid, brown, the bristles yellowish, with prominent dark, papillose bases, the basal bristles less than 1 mm long; commissural side with the median line raised, pale scar, on either side shiny, dark brown, alternating ridges and valleys; oil-tubes 4 on the commissural side, 1-3 in the intervals, seed in cross section oval, but the commissural face with a shallow, rounded channel.

Sanicula kauaiensis seems best allocated to the section *Campylospermae* as treated by Wolff, and placed near *S. sandwicensis* and *S. purpurea*. It is regrettable that the specimens do not show the basal leaves, but even without these it is quite evident that the plants from Kauai represent a distinct species. For comparative reasons the following differences between the species are listed.

S. kauaiensis has the upper leaves deeply spinose-laciniate-toothed; the perfect flowers 3-6; the sterile flowers with pedicels 1.5-2 mm long, with petals 1 mm long; the mericarps 1.1-1.3 mm wide, oblanceoloid, the bristles 1.5-2 mm long with dark papillose bases.

S. purpurea has the upper leaves not laciniate; the perfect flowers 1 (-2); the sterile flowers with pedicels 2-4 mm long, with the petals 1.7-1.9 mm long; the mericarps 2-2.5 mm long, with the bristles 1-1.4 mm long, not conspicuously enlarged at base.

Kauai: Waialae, J. F. Rock no. 5080 (194) (type in Bishop Museum); and 5081 (194), this being apparently a duplicate of the first number, as Rock seems to have given a different number to each sheet.

Key to Species of *Sanicula*

- Mericarps with the upper two-thirds bearing hooked bristles; perfect flowers several, in fruit densely capitate; petals yellow.....**S. sandwicensis**
 Mericarps covered almost to the base with straight bristles; fruit not densely capitate;
 Perfect flowers 1 (-2); petals madder-purple; mericarps 2-2.5 mm wide, subglobose; bristles 1-1.4 mm long, not conspicuously enlarged at base.....**S. purpurea**
 Perfect flowers 3-6; petals apparently yellowish; mericarps 1.1-1.3 mm wide, oblanceoloid; bristles 1.5-2 mm long, with dark papillose bases**S. kauaiensis**

Sanicula sandwicensis Gray, variety *lobata* Hillebrand, according to Wolff⁴ was described as having the leaves less lobed and more entire. There is a duplicate type from Mount Eeke, Maui, in Bernice P. Bishop Museum, but it consists only of four stems and inflorescences. These are undistinguishable from the species. Perhaps the type in the Berlin herbarium has the basal leaves, which may be different in character from those of the species. We have seen no other collections to correspond with the description of the variety, and hence omit it from the key until its status can be verified.

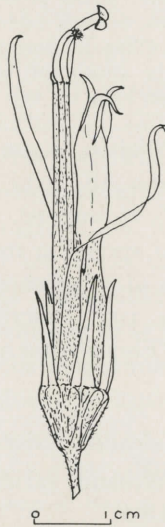


FIGURE 4.—*Lobelia oahuensis*.

FAMILY CAMPANULACEAE

Lobelia oahuensis Rock (fig. 4). Description amplified by Hosaka.

Plant 1-2 meters tall, with solid stem 4-7 cm in diameter, covered with leaf-scars, the upper part rusty tomentose; leaves 40-60 cm long, 4-6 cm wide, lanceolate, acuminate at both ends, the base tapering into fleshy petioles, which are 1-2.5 cm long, crowded at the apex, upper leaves smaller, glabrous and dark green above, below light green and white-hirsute; veins of lower surface prominent, midvein hispidulous above, margin revolute, with callous teeth; flowering stalks 3-7, the central flowering stalk 50-100 cm long, the axillary ones shorter, raceme 40-70 cm long, gray, woolly, hollow; pedicels 1-2 cm long, covered with grayish-white woolly hairs; bracts 2-4 cm long, 3-4 mm wide at base, acuminate at apex and broadly sessile at base, margin minutely serrate at

⁴ Engler, A., Pflanzenr. IV, Fam. 228, p. 71, 1913.

middle portion, midvein prominent, purple, lower surface hispidulous to glabrous toward the base, upper surface villous toward the base, glabrous toward the tip; corolla 4-5.5 cm long, the outer surface covered with whitish villous hairs toward the base, glabrous toward the tip, inner surface glabrous, corolla splitting into 5 unequal linear lobes at maturity, two lobes splitting half the length of the corolla, the other three splitting only about 1-1.5 cm down from the tip, corolla pale blue, becoming paler at maturity; buds green; calyx 2-2.5 cm long, the ellipsoid tube 5-9 mm long, 8-10 mm wide at top, covered with grayish-white woolly hairs, the prominent veins purple, calycine teeth 1-2 cm long, 3-4 mm wide at base, tapering into an acute point, glabrous, with only a midvein; staminal column 4.5-6 cm long, about 3-6 mm longer than the corolla, upper portion pale blue, villous, anthers 7-10 mm long, light blue, glabrous, lower beak bearded, upper one glabrous; pistils protruding about 5 mm beyond the anthers at maturity, stigma green, bilobed, folding slightly backward; capsules 9-14 mm long, 7-10 mm wide, ellipsoid, tomentose with short grayish-brown hairs, 10-ribbed, the tip above the attachment of the long calycine lobes conic, tapering to a point; seeds 0.4 mm long, 0.3 mm wide, ovoid.

Oahu, Koolau Range, Waipio, Kipapa Gulch: along the crest, altitude 2,800 feet, September 18, 1932, E. Y. Hosaka no. 685 in fruit; August 6, 1933, E. Y. Hosaka no. 1156 in flower.

Rock⁵, who collected this species at the top of the Koolau Range, Oahu, overlooking the cliffs of Waiamanalo at an elevation of about 3,000 feet on September 14, 1917, described the species from fruits and young buds. He says, "Flowers unknown but reported to be pale blue."

Rollandia lanceolata Gaudichaud, variety ***grandifolia*** De Candolle.

Rollandia lanceolata Gaudichaud, variety *grandifolia* De Candolle, Prodr., vol. 7, p. 344, 1838.

Rollandia lanceolata Gaudichaud, Bot. Voy. Uranie, p. 458, tab. 74 (as *R. montana*), 1826. *R. lanceolata* Gaudichaud, variety *typica* Rock, in part, B. P. Bishop Mus., Mem., vol. 7, no. 2, pp. 371, 373, 1919.

Rollandia lanceolata has numerous varieties, hence it is convenient to use the aggregate concept for the species and to have variety alpha to represent the plant first described. The variety *grandifolia* is a synonym, as treated by Rock. The type specimen is Macrae, from "Woahoo" (or Oahu) in the Geneva Herbarium. Professor B. P. G. Hochreutiner has kindly examined this for us. He reports that the corolla "is quite glabrous outside and not puberulous." There is a

⁵ Rock, F. J., Torrey Bot. Club, Bull., vol. 45, p. 137, 1918.

duplicate of this in the Gray Herbarium, and Dr. L. B. Smith reports that it has the "corolla perfectly glabrous." Then there is no need to coin a new name for this, and the original plant of Gaudichaud can be called (instead of variety *typica*) variety *grandifolia* De Candolle.

Rollandia lanceolata Gaudichaud, variety **Rockii** St. John and Hosaka, new name.

R. lanceolata Gaudichaud, variety *typica* Rock, in part, B. P. Bishop Mus., Mem. vol. 7, no. 2, pp. 371, 373, 1919.

The variety *typica* as described by Rock is based upon a curious confusion. The natural inference would be that it represented the original variety, that collected by Gaudichaud and described as *R. lanceolata* Gaudichaud. The Gaudichaud collection is not included in the list of representative specimens. However, it is dubiously mentioned in the next paragraph, as follows, "This is apparently Gaudichaud's *R. lanceolata* so far as can be determined from the fragmentary specimen in the Paris Museum." On the previous page it was stated that *R. lanceolata* was to be distinguished by its glabrous corolla, and here the Gaudichaud specimen is definitely listed. Mr. F. Pellegrin has kindly examined the type specimen of *R. lanceolata* Gaudichaud in the Paris Museum for us. He reports that the corolla is glabrous outside. On the contrary Rock in his description of his new variety *typica* states that it has a puberulous corolla, and the specimens which he definitely cites have the corolla puberulous outside. Then the situation is that his description and his specimens represent one variety, while his dubious reference to the Gaudichaud specimen and the implication of his new name, variety *typica*, suggest another. In disentangling this confusion we assign the name, variety *grandifolia* De Candolle, to represent the original plant of Gaudichaud, and a new name, variety *Rockii*, for the plant positively described by Rock (as variety *typica*) and for the specimens he cites. There are numerous duplicates of each of his cited numbers in Bernice P. Bishop Museum. None is marked type, nor was any indicated in the publication. We therefore designate J. F. Rock, no. 10254, Pauoa Valley, Oahu, Hawaiian islands, April 20, 1912 (in Bishop Museum) as the type of variety *Rockii*.

Rollandia lanceolata Gaudichaud, variety ***kipapaensis*** Hosaka, new variety (fig. 5).

An unbranched plant, 0.7-1.5 meters tall; corolla hirtellous, more so towards the tip, light purplish-gray to pale-ashy outside, staminal column glabrous; anther body glabrous, lower anthers penicillate at tip, the upper anthers glabrous.

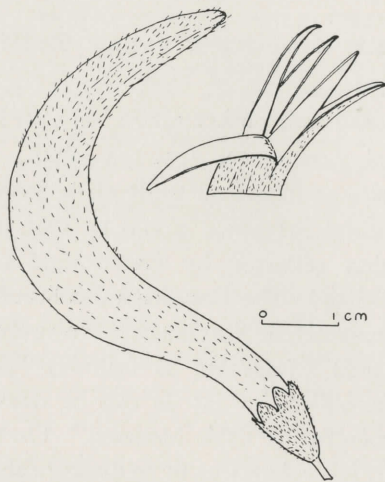


FIGURE 5.—*Rollandia lanceolata* variety *kipapaensis*.

This new variety comes close to *Rollandia lanceolata* Gaudichaud and *R. lanceolata* Gaudichaud, variety *Rockii* St. John and Hosaka, but closest to *R. lanceolata*, variety *tomentosa* Hillebrand. It may be distinguished from the related species and varieties as follows:

R. lanceolata has glabrous corolla, which is purple on outer and inner surfaces, staminal column puberulous near the base of the anther, anther body pilose at base, lower anthers penicillate, upper anthers glabrous. *R. lanceolata*, variety *Rockii*, has hirtellous corolla, which is purple on outer and inner surfaces, staminal column ciliate with whitish hairs, anther body pilose throughout, lower anthers penicillate, upper anther glabrous. *R. lanceolata*, variety *tomentosa*, has hirsute corolla, purplish-gray to pale-ashy, staminal column pilose, anther body pilose throughout, the lower and upper penicillate.

Oahu, Koolau Range, Waipio, Kipapa Gulch: in moist wooded gully, altitude 1,100 feet, May 14, 1933, E. Y. Hosaka no. 1027 (type in Bishop Museum).

R. lanceolata variety *kipapaensis* is judged to be a new variety because it differs in two or more important characters that are used in separating the varieties of the genus *Rollandia*.

Rollandia St.-Johnii Hosaka, new species (fig. 6).

Plantae 30-60 cm altae, foliis 6-13 cm longis 1.5-2 cm latis lanceolatis marginibus revolutis, pedunculis 1-1.5 cm longis hispidis bracteis 4-7 mm longis lanceolatis-acuminatis, pediculis 0.5-1 cm longis, tubuos calyx 4-7 mm longo, labis calycis 3-10 mm longis lanceolatis-acuminatis subhispidulis, corolla 3-6 cm longa alba glabra.

An unbranched upright plant, 30-60 cm tall; the stem terete, rough at the naked lower portion, 1.5-2 cm in diameter at base; leaves in terminal clusters, leaves 6-13 cm long, 1.5-2 cm wide, lanceolate, obtusely acuminate at tip, base tapering into fleshy, margined petiole, upper surface dark green, glabrous, veins depressed, veins of under surface rusty, muricate-hispidulous, midrib prominent, margin with callous teeth, edges revolute; petioles 1-1.5 cm long, muricate-hispidulous; racemes 15-20-flowered; peduncles 1-1.5 cm long, hispid, thick; peduncle bracts 4-7 mm long, lanceolate-acuminate, hispidulous; flowers clustered near the apex; pedicels 0.5-1 cm long, hispidulous, with two lanceolate-acuminate, glabrous bracts 0.5 mm long at the lower third; corolla 3-6 cm long, 0.5-1 mm wide at the broadest part which is $\frac{1}{2}$ to $\frac{2}{3}$ of the length, white, curved, glabrous on the outer and inner surfaces, back grooved to the middle, tip splitting into 5 narrow lobes 8-12 mm long at maturity, inner surface of lobes tinted with light purple color; calyx 14-17 mm long, sparsely hispidulous, the obconical tube 4-7 mm long, 4-5 mm wide at top, the calycine lobes 3-10 mm long, 2-3 mm wide at base, lanceolate-acuminate; staminal column 5-8 mm shorter than the corolla, adnate to the corolla ($\frac{1}{3}$ to $\frac{1}{2}$ the length), glabrous; anthers 4-7 mm long, purple, glabrous, tip of lower anther bearded, tip of upper anther glabrous; pistil protruding about 2-2.5 mm; stigma two-lobed; fruit a capsule.

This new species comes closest to *Rollandia crispa* Gaudichaud and *Rollandia Humboldtiana* Gaudichaud, both of which have glabrous staminal column and the underside of the leaf pubescent. This new species may be distinguished from these two as follows:

Rollandia crispa is 0.3-1.3 meters tall; with leaves 30-75 cm long, 10-16 cm wide, obovate-oblong; peduncles 2-3 cm long, puberulous; bracts 8-18 mm long, broad-oblong, obtuse; pedicels 1-2 cm long; calyx tube 8-12 mm long, the calycine lobes 9-14 mm long, broad-oblong, obtuse-apiculate, puberulous; corolla 5-7.5 cm long, pale purplish-red, puberulous.

Rollandia Humboldtiana is 1-2 meters tall; with leaves 26-40 cm long, 8-15 cm wide, obovate-oblong; peduncles 4-40 cm long, puberulous; bracts 8-11 mm long, lanceolate-acuminate; pedicels 1.5-2 cm long; calyx tube 9-11 mm long, calycine lobes 3-12 mm long, narrow-oblong, puberulous; corolla 7-7.5 cm long, white or purple, puberulous.

Rollandia St.-Johnii is 30-60 cm tall; with leaves 6-13 cm long, 1.5-2 cm wide, lanceolate, edges revolute; peduncles 1-1.5 cm long, hispid; bracts 4-7 mm long, lanceolate-acuminate; pedicels 0.5-1 cm long; calyx tube 4-7 mm long, the calycine lobes 3-10 mm long, lanceolate-acuminate, sparsely hispidulous; corolla 3-6 cm long, white, glabrous.

Oahu, Koolau Range, Waipio, Kipapa Gulch: on wet windswept main divide, altitude 2,800 feet, August 6, 1933, E. Y. Hosaka no.

1159 (type in Bishop Museum); wet ravine, 900 meters, September 18, 1932, F. R. Fosberg no. 8715; wet ridge, 2,800 feet, August 7, 1934, E. Y. Hosaka no. 1256; wet main divide, 2,800 feet, September 18, 1932, E. Y. Hosaka no. 743.

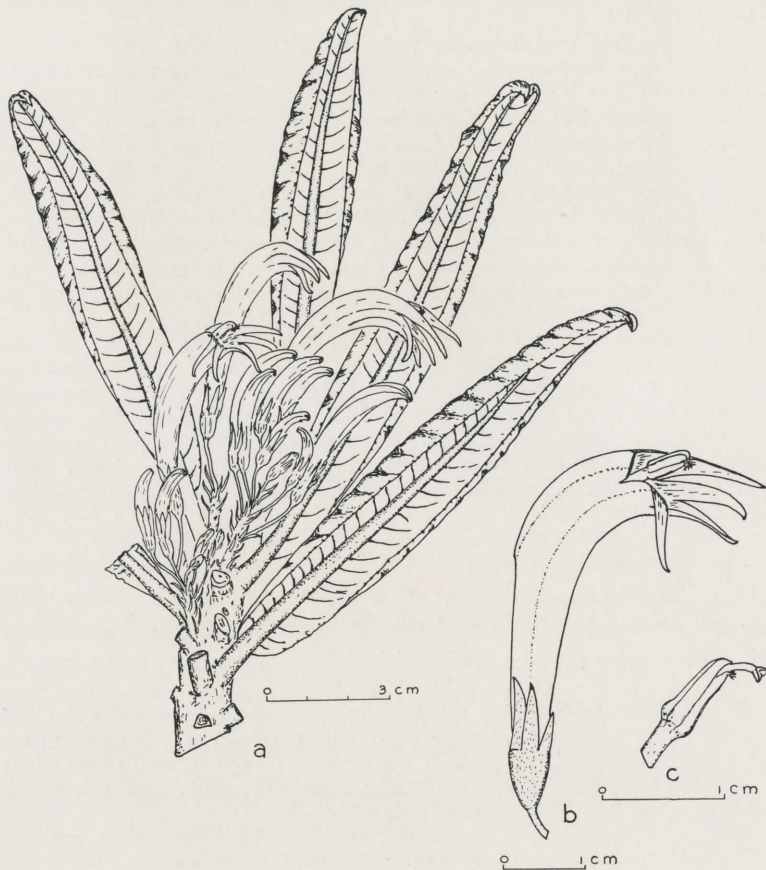


FIGURE 6.—*Rollandia St.-Johnii*: a, habit; b, flower; c, end of stamen with style.

This species is named after Dr. Harold St. John, Professor of Botany at the University of Hawaii and Botanist at Bernice P. Bishop Museum.

Rollandia St.-Johnii is found growing along the main divide of Koolau Range on leeward side at the head of the Kipapa Gulch and just over the divide on the windward side.



A



B

PLATE 1.—*Panicum koolaiense*: *A*, habitat (photo by M. B. Linford); *B*, habit (from Morley no. 190).

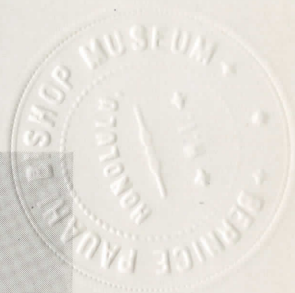


PLATE 2.—Habit of *Sanicula purpurea*.